

Two new cicada species from Shaanxi, China (Hemiptera : Cicadomorpha : Cicadidae)

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Abstract : New members of the Oriental genera *Neotanna* Kato, *N. shensiensis* sp. n., and *Terpnosia* Distant, *T. shaanxiensis* sp. n., are described from the Province of Shaanxi, China.

Key words : Cicada ; *Neotanna* ; *Terpnosia* ; taxonomy ; new species ; China

INTRODUCTION

The genus *Neotanna* was erected by Kato (1927) for a group of Oriental cicadas whose abdominal tubercles differed from those of the genus *Tanna* Distant. The tubercles of *Neotanna* species are found only on the third abdominal segment while the species of *Tanna* possess an additional pair of tubercles on the fourth abdominal segment. *Neotanna* was synonymized with *Tanna* by Duffels and van der Laan (1985) but the Chinese species were reassigned to *Neotanna* by Chou *et al.* (1997). Chou *et al.* (1997) counted seven species of *Neotanna* from China.

The genus *Terpnosia* is a widespread Oriental genus similar to members of the genus *Pomponia* from which the species can be distinguished by the uncovered tympana (Distant, 1892). Chou *et al.* (1997) described twelve species of *Terpnosia* as inhabiting China.

The diversity of the cicada fauna of Shaanxi Province has continued to increase with further study (Liu 1978 ; Chou *et al.*, 1997). The species identified here were found in the North Carolina State University Insect Collection (NCSU). They are very similar in general appearance until specimens are spread and the details of their morphology can be ascertained.

MATERIALS AND METHODS

The new species described here were found among the undetermined material in the NCSU, Raleigh, North Carolina, USA. Morphological measurements were made with Vernier calipers. Genitalia were drawn using a camera lucida on an Olympus dissecting microscope.

RESULTS

Neotanna shensiensis sp. n. (Figs. 1 – 3)

Type material. HOLOTYPE male : CHINA : Shensi [Shaanxi], 14-VI-36, R. Suenson (NCSU). PARATYPE male : CHINA : Shensi [Shaanxi], 12-VI-36, R. Suenson (author 's collection).

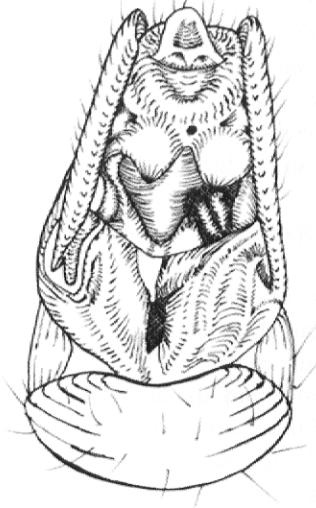
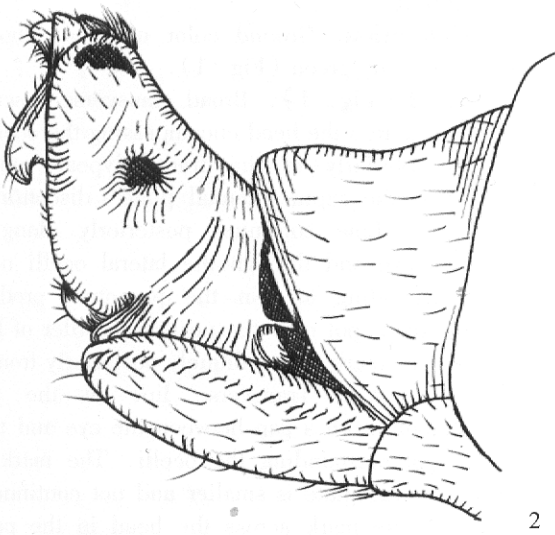
Etymology. The species is named for the region where the specimens were originally collected, Shensi (now Shaanxi) Province.

Description

Coloration. Ground color of head, thorax and abdomen tawny green (Fig. 1).

Head (Fig. 1). Broad transverse fuscus band extending across the head encompassing the ocelli. Line extends anteriorly to the fronto-clypeal suture and laterally to the supra-antennal plate (discontinuous in paratype). Line continues posteriorly along medial border of eye and through the lateral ocelli narrowing before expanding to join the pronotum producing a mediad green spot near the posterior border of head. A small fuscus mark runs obliquely posteriorly from medial margin of eye. Transverse line in the paratype discontinuous with a gap between the eye and the large fuscus spot surrounding the ocelli. The mark on the supra-antennal plate is smaller and not continuous with the transverse mark across the head in the paratype. Postclypeus with green triangle along front-clypeal suture. The anterior four transverse lines and ridges fuscus with the medial portion of the next three decreasing in proportion of fuscus surrounding a green medial spot. The lateral fuscus marks converge medially and then expand forming a large medial fuscus spot which extends along the lateral border of the anteclypeus and mandibular plate. Lateral surfaces of postclypeus green. Anteclypeus with a pair of parallel

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Figs. 1–3 *Neotanna shensiensis* n.sp.

1. Type male (Bar = 2 cm); 2. Lateral view of paratype male genitalia; 3. Posterior view of paratype male genitalia.

dark-brown spots laterally connected by a light transverse medial band. Rostrum tawny with a fuscus tip reaching to just past the posterior borders of the hind leg coxae. Mandibular plate fuscus except for the anterior edge which is tawny green. Genae with a transverse fuscus line about in the middle extending from the postclypeus to the inner margin of the eye.

Thorax (Fig. 1). Fuscus central fasciae on the pronotum which diverges anteriorly. Each central fascia

strongly widens at the anterior margin of the pronotum connecting medially by a transverse line. Anterior and posterior oblique fissures fuscus with a fuscus mark arching posteriorly from the middle of the anterior oblique fissure. Ambient fissure fuscus, the mark continuing laterally and posteriorly onto the pronotal collar. There is a fuscus spot on the lateral edge of the pronotal collar. Hind border of pronotal collar edged in fuscus medially and behind posterior mark near ambient

fissure. Mesonotum with a fuscus median fascia extending from the anterior margin to the cruciform elevation. The median fascia widens and narrows twice from the anterior margin to about the middle of the mesonotal disk before narrowing again to the width of the anterior part and continuing on to the cruciform elevation where it terminates in a small black triangle. The paramedian fasciae oriented mediad to about the middle of the mesonotum. A pair of round black spots is situated in front of the cruciform elevation which extend onto the ends of the anterior arms. A small triangular spot between the anterior portions of the paramedian and lateral fasciae. Triangular spot larger in paratype fusing with the paramedian fascia. The lateral fasciae are continuous almost joining with the spots in front of the anterior arms of the cruciform elevation. The posterior ends appear to curve laterally toward a small lateral spot. This spot is connected to the lateral fascia in the paratype. Cruciform elevation ground color.

Legs. Tawny green. Coxae edged proximally and distally with brown. Trochanters of middle and hind legs with a medial brown spot. Fore femora with two large proximal fuscus spines separated by green and a small distal fuscus spine along the under ridge, proximal and distal portions with annular fuscus marks connected dorsally by a faint fuscus line. Middle and hind femora fuscus rings around the proximal and distal portions and a faint longitudinal brown line connecting the rings. Tibiae fuscus except for a tawny band at two-thirds the length. Metatarsus and mesotarsus tawny. Pretarsus fuscus distally except in the hind leg where it is edged in fuscus. Claws of all legs fuscus.

Tegmina and wings (Fig. 1). Hyaline. Basal venation of tegmina tawny, turning fuscus distally. Costal margin green. Cubital vein green in paratype. Proximal radial vein (node is tawny), medial crossvein, a central spot on the vein between the medial and ulnar cell, the proximal half of the vein between the medial cell and marginal cell and the crossvein between the marginal and cubital cells marked with fuscus. Basal veins of first, second, third, and fifth apical areas infuscated, apices of the longitudinal veins with small brown spots. Small spot in the distal portion of the basal cell which colors the crossvein. Venation of the wings fuscus except for the cubital vein which is tawny. Anal membrane grayish.

Operculum. Male operculum tawny green edged anteriorly and laterally with fuscus, not reaching the posterior margin of abdominal segment II. Operculum rounded posteriorly and medially. Opercula well separated along midline reaching medially to the distal portion of the hind leg trochanter. Meracanthus tawny with a fuscus base.

Abdomen (Fig. 1). Dorsal abdomen tawny

centrally, ochraceous laterally. Anteromedian spot dorsally on segments II – III. Anteromedian spot of segment II extends onto posterior portion of segment I extending laterally along the fuscus posterior border of segment I. Timbal covers tawny exposing the timbal ventrally and medially. Lateral spots on segments III – VII, Lateral spot on segment V very small, lateral spots on segments VI and VII larger than spots on segments III and IV. Segments III and IV (and V in paratype) with a second lateral spot dorsal to the row of lateral spots. Segment VIII fuscus anteriorly (one-half in holotype, three-fourths in paratype). Abdomen ventrally tawny with a dusting of white, pruinose wax laterally. Tubercles on segment III. Segment II fuscus ventrally. Small fuscus spots laterally on ventral side of segment VII. Lateral portions of segments III – VI are partially transparent ventrally.

Male genitalia (Figs. 2, 3). Pygofer with a central fuscus mark and short lateral processes which are curved apically and which do not project beyond the apices of the anal valves. Central mark reduced to a spot in paratype with additional small distal mark in paratype (Fig. 2). The lateral uncus lobes bend downward to form a roughly triangular shape posteriorly forming a canal for the aedeagus with the median uncus lobe. The aedeagus bears two pairs of appendages.

Measurements (in mm). Males ($n = 2$), mean (with range) given for available specimens. Length of body : 32.2(32.1 – 32.3); length of fore wing : 35.5 (35.4 – 35.6); width of fore wing : 11.5(11.4 – 11.6); length of head : 3.74(3.68 – 3.80); width of head including eyes : 7.79(7.78 – 7.80); width of pronotum including suprahumeral plates : 8.85(8.78 – 8.92); width of mesonotum : 7.77(7.76 – 7.78).

***Terpnosia shaanxiensis* sp.n.** (Figs. 4 – 6)

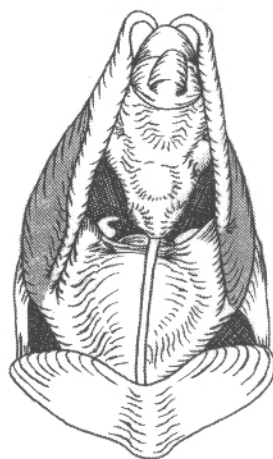
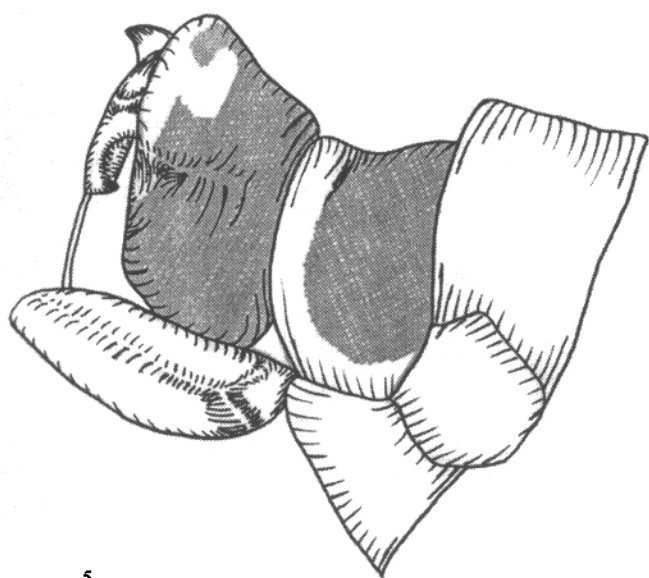
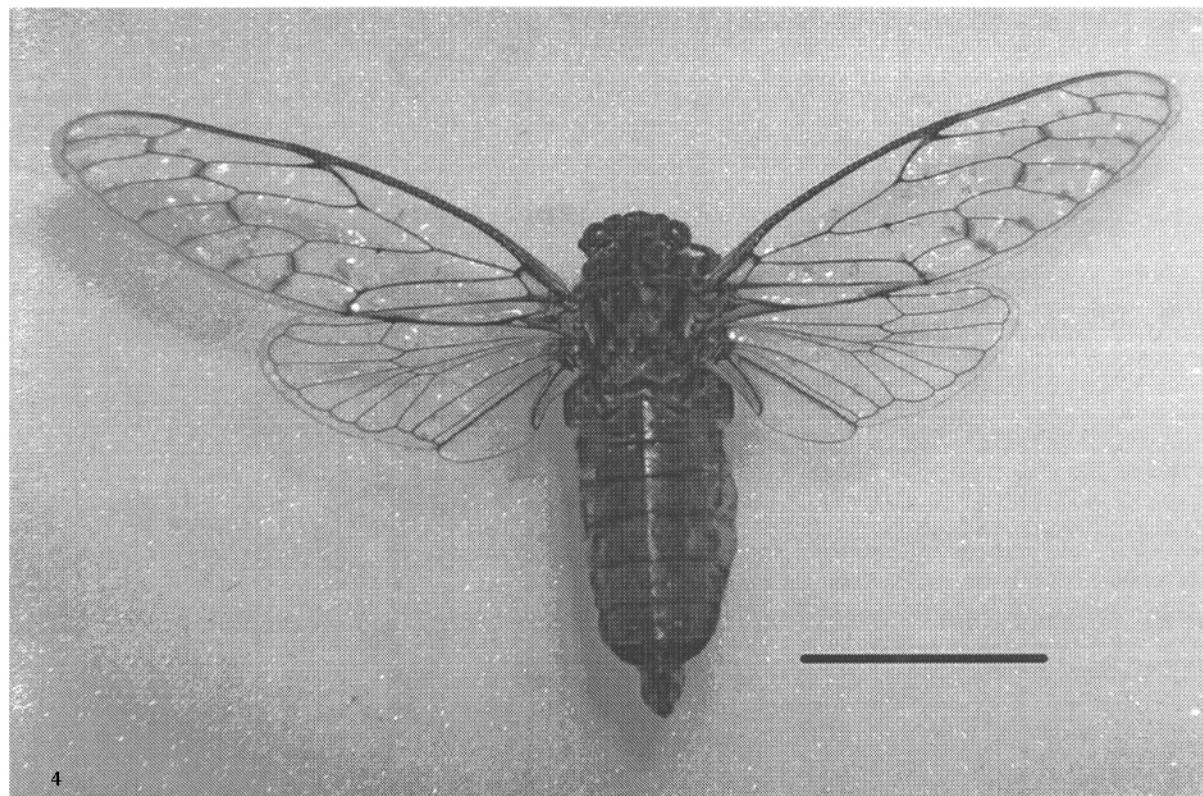
Type material. HOLOTYPE male : CHINA : Shensi [Shaanxi], 18-VI-36, R. Suenson (NCSU). PARATYPE male : CHINA : So. Shensi [Southern Shaanxi], 12-VI-36, R. Suenson (author's collection).

Etymology. The species is named for the current name of the region where the specimens were collected, Shaanxi Province.

Description

Coloration. Ground color of head, thorax and abdomen tawny tinged with green (Fig. 4).

Head (Fig. 4). Head fuscus centrally. Tawny band from medial margin of the eye anteriorly along the supra-antennal plate. Median extension from medial margin of the eye greater in paratype. Small oblong tawny spot extending from anterior to anteriolaterad of each lateral ocellus (separated into two spots in the paratype). Tawny spots posteriolaterad to lateral ocellus to posterior border of head. Spots larger in paratype



Figs. 4-6 *Terpnosia shaanxiensis* n. sp.

4. Type male (Bar = 2 cm); 5. Lateral view of type male genitalia; 6. Posterior view of type male genitalia.

appearing to be separated from medial extension of tawny margin of the median eye by an oblique fuscus line. Small tawny lines along suture between vertex lobe and supra-antennal plate (additional mark along suture with front in paratype). Postclypeus with green triangle along frontoclypeal suture. Transverse ridges and lateral border of postclypeus tawny. Postclypeus with a series of fuscus transverse lines between the transverse ridges connected medially by an arcuate line. The lines of

each side connect medially dorsally, in the center and ventrally producing two tawny marks along the midline. Anteclypeus fuscus laterally connected by a pair of transverse medial bands across the tawny midline. Rostrum brown with a fuscus tip reaching the hind borders of the hind leg coxae. Mandibular plate fuscus. Genae with a transverse fuscus line about in the middle which extends from the postclypeus to the inner margin of the eye.

Thorax (Fig. 4). Fuscus central fasciae of pronotum diverge laterally along anterior and posterior borders continuous with fuscus mark in anterior half of anterior oblique fissure and fuscus marks within posterior oblique and ambient fissures. Anteriolaterad extensions of central fasciae in paratype produce a semicircular mark along the anterior tawny pronotal border. Posterior laterad extensions incomplete in paratype. Mark in anterior oblique fissure arches posteriorly from the center of the fissure. Fuscus spot on lateral pronotal collar. Additional mark extending obliquely laterally across pronotal collar from posterior oblique fissure. Central fasciae extend posteriorly across pronotal collar in paratype producing an hourglass shaped spot medially. Anterior edge of pronotal collar edged with fuscus. Mesonotum with a black median fascia extending from the anterior margin to the cruciform elevation. The median fascia narrows centrally and expands posteriorly to slightly wider than its anterior width. The paramedian fasciae curve medially and anteriorly fusing with the median fascia. A pair of round black spots is situated in front of the cruciform elevation which extend to the lateral fascia. Lateral fasciae continuous, the posterior ends curve laterally. Small triangular spot between the anterior portions of the paramedian and lateral fasciae. A fuscus posterior spot extends laterally parallel to the extension of the lateral fascia and medially across the distal portion of the anterior arm of the cruciform elevation. Cruciform elevation testaceous. Mesonotum greenish laterally and on mesonotal disk in paratype.

Legs. Fuscus marked with tawny. Coxae fuscus edged distally, medially, and laterally with tawny. Trochanters proximally and posteriorly tawny. Fore femora tawny with a proximal and distal fuscus annular mark connected dorsally by a small fuscus line. One small proximal and one small distal spine. Proximal spine oblique, distal spine upright. Middle and hind femora with similar markings except distal tawny portion larger. Tibiae fuscus with a proximal tawny end and a narrow proximal tawny ring at about one-third the length of the tibia. Distal end tawny in middle tibia, hind tibia tawny except for proximal fuscus annulus. Metatarsus fuscus. Mesotarsus of fore leg and middle leg fuscus and of hind leg tawny. Pretarsus tawny. Claws of all legs fuscus.

Tegmina and wings (Fig. 4). Hyaline. Basal venation of tegmina tawny, turning darker brown distally. Costal margin tawny in holotype, green in paratype. Costal and subcostal veins edged with fuscus. Proximal radial vein, node, medial crossvein, a central spot on the vein between the medial and ulnar cell, the proximal half of the vein between the medial cell and marginal cell and the crossvein between the marginal and cubital cells marked with fuscus. Basal veins of

first, second, third, fifth and seventh apical areas infuscated, apices of the longitudinal veins and distal portion of the anal cell with slightly smaller brown spots. Small spot in the distal portion of the basal cell which colors the crossvein. Venation of the wings fuscus except for the cubital vein which is tawny. Anal membrane grayish.

Operculum. Male operculum fuscus (lighter in center) with tawny posterior border reaching the posterior border of segment II. Sinuate hind border, rounded medially and posteriolaterally. Medial length less in paratype making posteriolateral angle greater. Opercula well separated along midline reaching the middle of the trochanter of the hind leg. Meracanthus tawny with a fuscus base.

Abdomen (Fig. 4). Dorsal abdomen tawny centrally, ochraceous laterally. Anterior border of segment II edged in fuscus. Lateral spots on segments II – VII except segment V, Lateral spot on segment IV and VI very small, lateral spots on segments II and VII largest. Additional spots on anteriolateral portion of segments VI and IV. Segment VIII fuscus except for the posterior border. Timbal cover small covering a portion of the posterior mediad timbal. Abdomen ventrally ochraceous except segment II which is fuscus. Lateral portions of segments III – VI are partially transparent ventrally.

Male genitalia (Figs. 5, 6). Pygofer brownish fuscus edged posteriorly with tawny. Pygofer with the short lateral processes which are curved apically and which do not project beyond the apices of the anal valves. The lateral uncus lobes are small curving to the middle of the median uncus lobe. Lateral distal edges of median uncus lobe bent downward. The aedeagus is thin, bifurcating at the tip.

Measurements (in mm). Males ($n = 2$), mean (with range) given for available specimens. Length of body : 36.0(35.4 – 36.6); length of fore wing : 37.3 (36.9 – 37.7); width of fore wing : 11.49(11.48 – 11.50); length of head : 3.8(3.7 – 3.8); width of head including eyes : 7.88(7.80 – 7.96); width of pronotum including suprahumeral plates : 10.05(10.0 – 10.1); width of mesonotum : 8.44(8.1 – 8.78).

DISCUSSION

Neotanna shensiensis possesses characteristics similar to other Chinese *Neotanna*. Although larger than both species, *N. shensiensis* has opercula similar in shape to *N. condyla* Chou et Lei, 1997 and the uncus approaches that of *N. yunnanensis* Lei et Chou, 1997 as figured in Chou et al. (1997). The genitalia of *T. shaanxiensis* are similar to the much smaller *T. andersoni* figured in Chou et al. (1997). The only described *Terpnosia* from China near the size of *T.*

shaanxiensis is *T. nigricosta* (Motschulsky, 1866) also from Shaanxi. The darker dorsal coloration pattern and differently shaped opercula (as illustrated in Distant 1892) of generally smaller *T. nigricosta* easily separate the species.

Liu (1978) listed five species of cicadas inhabiting Shaanxi (Shensi). He further listed all species as endemic to the province. Chou *et al.* (1997) identified 24 species from 15 genera with six species (25%) and one genus being endemic to Shaanxi Province. The addition of the two new species increases the percentage of endemic species to 30.8%. It appears the diverse habitats of the region have stimulated the production of a unique cicada fauna within the province.

Acknowledgements I thank Aline Hida for producing the illustrations of the genitalia and Xiaotang Hu for translating the Chinese literature. Lewis Dietz and Robert Blinn provided assistance while visiting the North Carolina State University Insect Collection.

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陕西省蝉科二新种 (半翅目: 蝉亚目)

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摘要: 描述了 1936 年 6 月采自陕西省的蝉科两新种: *Neotanna shensiensis* sp.n. 和 *Terpnosia. shaanxiensis* sp.n.。正模标本保存在北卡罗来纳州立大学昆虫标本馆(NCSU); 副模保存在作者处。

关键词: 蝉; *Neotanna*; 春蝉属; 分类; 新种; 中国

中图分类号: Q969 **文献标识码:** A **文章编号:** 0454-6296(2006)05-0829-06